

Profiled composite slab strength determination method

ABSTRACT

The purpose of this article is to develop a new numerical approach for determining the strength capacity of a profiled composite slab (PCS) devoid of the current challenges of expensive and complex laboratory procedure required for establishing its longitudinal shear capacity. The new Failure Test Load (FTL) methodology is from a reliability-based evaluation of PCS load capacity design with longitudinal shear estimation under slope-intercept (m-k) method. The limit-state capacity development is through consideration of the experimental FTL value as the maximum material strength, and design load equivalent estimation using the shear capacity computation. This facilitates the complex strength verification of PDCS in a more simplified form that is capable of predicting FTL value, which will aid in determining the longitudinal shear of profiled deck composite slab with ease. The developed strength determination effectively performs well in mimicking the probabilistic deck performance and composite slab strength determination. The strength test performance between the developed scheme and the experiment-based test results indicates high similarity, demonstrating the viability of the proposed strength determination methodology.

Keyword: Slope-intercept method; Reliability; Profiled composite slab; Longitudinal shear; First order reliability method; Strength test